

### REMARKS

Claims 1-6 have been amended. No new matter has been added. Support for the claim amendments may be found in the claims as originally filed and throughout the specification. New claim 7 has been added. No new matter has been added. Support for new claim 7 may be found throughout the specification.

Claims 1-7 are pending.

### SPECIFICATION

The Examiner has objected to the specification "as failing to provide proper antecedent basis for the claimed subject matter." See Office Action at p. 2. Specifically, the Examiner contends that there is no specific disclosure of how the phrase "amplifying the amount and rate of ethylene produced in ..." is "performed so in the specification." *Id.* Applicants respectfully traverse this objection.

Applicants submit that a person of skill in the art, reading the specification would understand that the instrument that makes these measurements of ethylene concentration uses mass selected precursor ions to react with ethylene in the head space above a solution. See for example, p. 5, line 32 to p. 6, line 2 of the specification. The precursor ion is O<sub>2</sub><sup>+</sup> and this is mass selected from the microwave discharge. See p. 6, lines 4-5 and 9-10 of the specification. As O<sub>2</sub><sup>+</sup> is the only precursor ion that is injected into the flow tube, it reacts with the volatile species that are there. See p. 6, lines 33 of the specification. In this assay, ethylene is present as the major volatile species. See p. 6, line 33 of the specification. The reaction between O<sub>2</sub><sup>+</sup> and ethylene is clearly visible from the amplitude of the ethylene product ion signal.

Accordingly, the specification provides proper antecedent basis for the claims such that the meaning of the terms in the claims are ascertainable by reference to the description. Applicants respectfully request reconsideration and the withdrawal of this objection.

### CLAIM OBJECTIONS

The Examiner has objected to the phrase "the measuring" in line 2 of claim 1 and has further suggested adding "activities" after the phrase "the oxidative free radical." See Office Action at p. 2. The Examiner has additionally suggested replacing the phrase "introduced

analyte antioxidant activity” with “antioxidant activity of the analyte.” *Id.* Applicants thank the Examiner for suggestions. Claim 1 has been amended to clarify the language of the claim. Applicants respectfully request the withdrawal of this objection.

### **CLAIM REJECTIONS**

#### ***Rejection under 35 U.S.C. § 112***

The Examiner has rejected claims 1-6 under 35 U.S.C. § 112, second paragraph, as being indefinite. See Office Action at p. 2. The Examiner has pointed out the terms and phrases in the claim 1 that render claim 1 indefinite. See Office Action at p. 2-3. In addition, the Examiner “strongly suggests applicant to rewrite the preamble of claim 1.” See Office Action at p. 3.

Applicants have rewritten claim 1 to clarify the claim language. As amended, Applicants believe that claim 1 as a whole would apprise one of ordinary skill in the art of its scope. Applicants respectfully request reconsideration and the withdrawal of this rejection.

The Examiner has additionally rejected claim 2 for insufficient antecedent basis for the phrase “trace elements” and “the helium stream.” See Office Action at p. 3. Claim 2 depends from independent claim 1. Applicants have amended claim 1 to recite “trace volatiles” and claim 2 has also been amended accordingly. Applicants have further amended claim 2 to clarify that the inert carrier gas is helium. As such, Applicants believe claim 2 is clear and the claim as a whole, would apprise one of skill in the art of its scope. Applicants respectfully request reconsideration and the withdrawal of this rejection.

The Examiner has rejected claim 3 for insufficient antecedent basis for the phrase “the measurement of the rate and amount of introduced analyte.” See Office Action at p. 4. Claim 3 depends from independent claim 1. Applicants have amended claim 1 to clarify that the method of determining, measuring and comparing the oxidative free radical activities and scavenging activities in a natural or synthetic substance includes detecting, amplifying and analysing the amount and rate of the trace volatile produced in the reaction mixture as a measure of the rate and amount of the natural or synthetic substance, the rate and amount being indicative of the oxidative free radical activities and scavenging activities of the natural or synthetic substance. Applicants have further amended claim 3 to recite that the partial pressure of ethylene in the gas sample is calculated as part of the measurement of the rate and amount of the natural or synthetic

substance. Accordingly, the claims as a whole would apprise one of skill in the art of their scope. Applicants respectfully request reconsideration and the withdrawal of this rejection.

The Examiner has rejected claim 5 for insufficient antecedent basis for the phrase “each gas species of volatile organic compounds in **the gas mixture.**” (emphasis by the Examiner). See Office Action at p. 4. Claim 5 depends from independent claim 1. Applicants have amended claim 5 to include the phrase “gas sample.” The phrase “gas sample” has antecedent basis in claim 1. Applicants respectfully request the withdrawal of this rejection.

The Examiner has rejected claim 6 for the recitation of the phrase “as second mass filter.” See Office Action at p .4. Claim 6 depends from independent claim 1. Applicants submit that it is clear from claim 1 that a mass filter is used in the method of determining, measuring and comparing the oxidative free radical activities and scavenging activities in a natural or synthetic substance. However, in an effort to expedite prosecution, Applicants have amended claim 6 to remove reference to the term “second.” Applicants respectfully request the withdrawal of this rejection.

### ***Rejection under 35 U.S.C. § 103***

The Examiner has rejected claims 1-6 under 35 U.S.C. § 103(a) as being unpatentable over Winston et al., *Free Radical Biology & Medicine*, Vol. 24, No. 3, p. 480-493 (1989) (“Winston”) in view of Wilson et al., *Journal of American Society of Mass Spectrum*, Vol. 13, p. 1028-1033 (2002) (“Wilson”). See Office Action at p. 5. Claims 2-6 depend from independent claim 1.

As amended, claim 1 relates to a method of determining, measuring and comparing the oxidative free radical activities and scavenging activities in a natural or synthetic substance including taking a gas sample from the headspace of an oxidative free radical reaction mixture including the natural or synthetic substance and an appropriate radical generator and a suitable reactive substrate, producing, mass selecting and accelerating precursor ions into a stream of inert carrier gas, thereby forming an inert carrier gas/ion stream, injecting the gas sample into the inert carrier gas/ion stream, allowing a trace volatile in the gas sample to react with the selected precursor ions thereby forming product ions, detecting, amplifying and analysing the amount and rate of the trace volatile produced in the reaction mixture as a measure of the rate and amount of

the natural or synthetic substance, the rate and amount being indicative of the oxidative free radical activities and scavenging activities of the natural or synthetic substance. The preferred reactive substrate is  $\alpha$ -keto- $\gamma$ -methiolbutyric acid.

The Examiner alleges that “Winston et al. disclose a method of determining, measuring and comparing the oxidative radical activity in a natural or synthetic substance (abstract), comprising measuring the concentration of ethylene as an assay for antioxidant activity to provide a measurement of the concentration of the analyte to thereby indicate the total activity of an antioxidant and the rate of reaction of the antioxidant with the substrate (abstract: The chemical species involved in the assay are identical to the ones disclosed in the instant application.)” See Office Action at p. 5. The Examiner acknowledges that “Winston et al. do not employ mass spectroscopy in their assay,” but contends that “Wilson et al. show a use of SIFT-MS technology to detect trace levels of compounds by monitoring chemical reactions between ionized species with hydrocarbons and trace levels of compounds (abstract, line 11-12).” Id.

Applicants respectfully traverse this rejection. Winston demonstrates that ethylene can be monitored using GCMS after it was generated from KMBA and the amount of ethylene relates to the antioxidant properties of the species being tested. See for example, abstract of Winston. Winston used thermal generation (this means the temperature of solution is sufficient to generate peroxy radicals) from ABAP. See Materials and Methods section on p. 482. Winston does not teach or suggest using an appropriate radical generator and a suitable reactive substrate as described in claim 1. Further, as acknowledged by the Examiner, Winston does not teach or suggest using SIFT-MS technology. Winston does not teach or suggest to a method of determining, measuring and comparing the oxidative free radical activities and scavenging activities in a natural or synthetic substance including taking a gas sample from the headspace of an oxidative free radical reaction mixture including the natural or synthetic substance and an appropriate radical generator and a suitable reactive substrate, producing, mass selecting and accelerating precursor ions into a stream of inert carrier gas, thereby forming an inert carrier gas/ion stream, injecting the gas sample into the inert carrier gas/ion stream, allowing a trace volatile in the gas sample to react with the selected precursor ions thereby forming product ions, detecting, amplifying and analysing the amount and rate of the trace volatile produced in the

reaction mixture as a measure of the rate and amount of the natural or synthetic substance, the rate and amount being indicative of the oxidative free radical activities and scavenging activities of the natural or synthetic substance.

This defect is not remedied by the Wilson reference. On its face, the Wilson reference does not qualify as prior art under either 35 U.S.C. § 102(a), (b) or (e). The effective filing date of the instant application (July 5, 2002, by virtue of a claim of priority to NZ 520019, and the disclosure therein) predates the publication of the Wilson reference (July 24, 2002). The actual contributions of the co-author (Murray J. McEwan) of the Wilson reference and Applicants are clarified in a Declaration of Murray J. McEwan Under 37 C.F.R. § 1.132 submitted herewith ("the 1.132 declaration," attached as Appendix A). Any disclosure in the Wilson reference relevant to the present claims is the Applicants' own work. Because the Wilson reference is not available under § 102(a), (b), or (e), it cannot be used to support an obviousness rejection under § 103(a). Applicants, therefore, respectfully request that the Examiner reconsider and withdraw this rejection.

Since claims 2-6 depend on claim 1, claims 2-6 are also patentable over the combination of Winston and Wilson for at least the reasons described above. Applicants respectfully request reconsideration and withdrawal of this rejection

### CONCLUSION

Applicant believes that the claims are in condition for allowance. Should any fees be required by the present Reply, the Commissioner is hereby authorized to charge Deposit Account 19-4293.

Respectfully submitted,

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# **APPENDIX A**



Attorney's Docket No.: 15313.0001

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the application of: McEwan et al.

Serial No.: 10/520,074

Filed: June 22, 2005

For: *Method of assaying the antioxidant activity of pure compounds, extracts and biological fluids*

Examiner: Sasaki, Shogo

Group Art Unit: 1797

**Mail Stop Amendment**

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**DECLARATION OF MURRAY J. MCEWAN UNDER 37 C.F.R. §1.132**

I, Murray J. McEwan, declare:

1. I am a Professor of Chemistry at the University of Canterbury and am also Chief Technical Officer at Syft Technologies Ltd.

2. I believe that I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the above-captioned application, the specification of which was filed on June 22, 2005, as Application Serial No. 10/520,074 and claims benefit from PCT Application No. PCT/NZ2003/000141 filed on July 4, 2003, which claims benefit from New Zealand Application No. 520019, filed on July 5, 2002.

3. I have reviewed the Office Action dated January 8, 2009 issued in this application. In this Office Action, claims 1-6 were rejected under 35 U.S.C. § 103(a) as being obvious over Winston et al., *Free Radical Biology & Medicine*, Vol. 24, No. 3, p. 480-493 (1989) ("Winston") in view of Wilson et al., *Journal of American Society of Mass Spectrum*, Vol. 13, p. 1028-1033 (2002) ("Wilson"). I am also an author of the subject matter disclosed in the Wilson reference.

4. The other co-authors of the Wilson reference are Paul F. Wilson, Daniel B. Miligan, Liew Wai Lam, Colin G. Freeman and Michael Meot-Ner (Mautner). Paul F. Wilson,

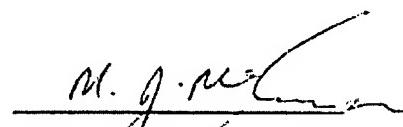
Applicant : McEwan et al.  
Serial No. : 10/520,074  
Filed : June 22, 2005  
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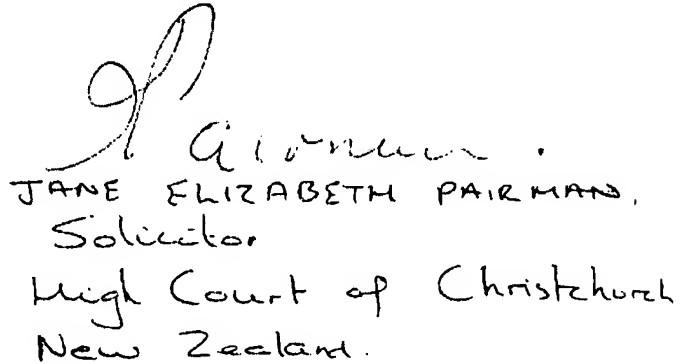
Attorney's Docket No.: 15313.0001

Daniel B. Miligan, Liew Wai Lam, Colin G. Freeman and Michael Meot-Ner (Mautner), while co-authors of subject matter disclosed in the Wilson reference, are not co-inventors of the subject matter claimed in the above-captioned application. Unlike me, Paul F. Wilson, Daniel B. Miligan, Liew Wai Lam, Colin G. Freeman and Michael Meot-Ner (Mautner) were not involved with any discovery or development of subject matter which is claimed and for which a patent is sought on the above-captioned application.

5. All statements made herein of my knowledge are true and all statements made on information and belief are believed to be true; and further these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Date: 3/4/2007

  
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Murray J. McEwan

  
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